# POLARIS

## A Tool to Support Program and Project Managers at NASA

Kelly Looney

Project Management Challenge 2006

Moody Gardens Hotel & Convention Center

Galveston, Texas

March 21-22, 2006

# Background

- NASA Office of the Chief Engineer (OCE) vision: *"achieve Project Management Excellence"*
  - OCE mission: *"provide policy direction, oversight, and assessment for the NASA program management communities"*
- OCE tasked late in 2004 to improve several areas, including Agency investment management and support
  - Create revision to NASA Program and Project Management Processes and Requirements (NPR 7120.5)
  - Develop a web-based tool (POLARIS) to support the PM community in implementing the revised policy

# Background

- POLARIS Project was formed late in 2004
- Project Management:  MSFC
- Project Implementation: JPL
  - JPL modified its Project Support Website as prototype for POLARIS
- Operational Hosting: MSFC supports Agency-wide websites in NASA Data Center (NDC)
- Funding received in early 2005
  - Project System Requirements generated
  - Prototype website delivered and reviewed June 2005
  - Build 1 capabilities added and preliminary V&V completed December 2005
  - NASA HQ decision to make Build 1 Operational: Jan 2006
  - Go-Live decision: March 2006

# Roll Out Plans

- POLARIS plans to be available to the agency PM community in the later half of 2006

- POLARIS will be rolled out to the PM community
  - Current thinking is to host a road-show with live web-site demonstration for NASA HQ and field centers.
  - Hope to provide link (or announcement) on Inside NASA
  - Participate in 2007 PM Conference and other relevant agency events

***POLARIS will be maintained current with agency policy, requirements, and processes!***

# What everyone wants to know…

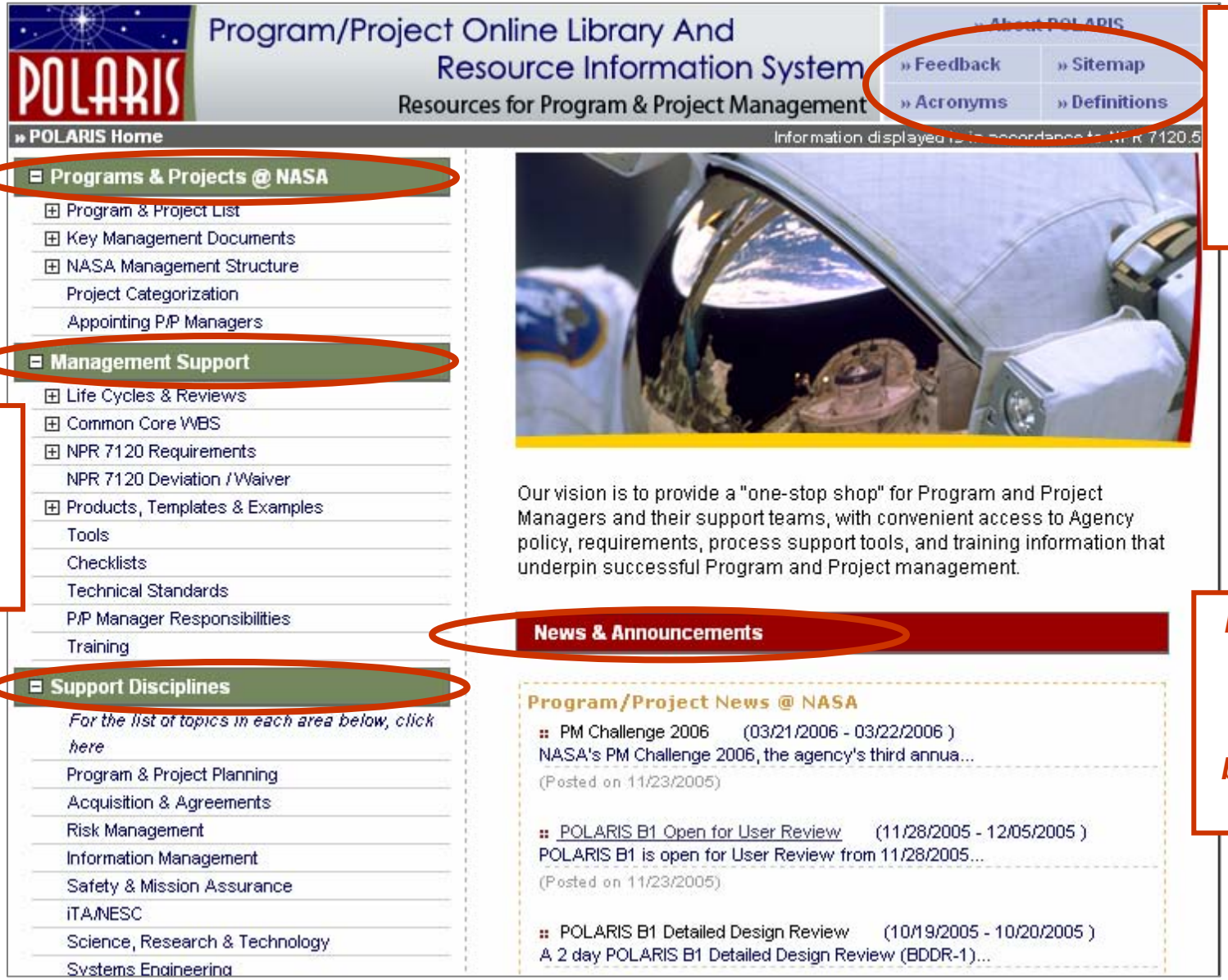
- *What will this website do for me?*

## Provide a one-stop shop for access to….

- **A searchable, sortable database of all requirements in NPR 7120.5**
- **An exportable compliance matrix of all 7120.5 requirements**
- **Project life cycle diagrams with reviews**
- **Project review definitions with products**
- **Templates and examples of products**
- **Project standard WBSs with dictionaries, and requirements for implementation and approval**
- **An exportable compliance matrix of all 7120.5 requirements**
- **NPR7120.5 deviation and waiver form and instructions**

***…….and much more***

# Homepage




*Acronyms, Definitions, and Feedback always available*

*Left side menu navigation consistent throughout*

*Homepage has news listing, which will be updated regularly*

# Agency Program/Project List

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

- Programs & Projects @ NASA
  - Program & Project List
    - TABLE FORMAT
    - Tree Format
    - Program/Project Search
  - Key Management Documents
  - NASA Management Structure
  - Project Categorization
  - Appointing P/P Managers
- Management Support
- Support Disciplines

| Mission Directorate/Support | Relevant Theme | Program | Project or Activity |
|---|---|---|---|
| Education | Education Theme | Minority University Research and Education Program (MUREP) | Minority University Research and Education Corporate Support |
| Education | Education Theme | Minority University Research and Education Program (MUREP) | Minority University Research and Education Congressional Earmarks |
| Exploration Systems | Constellation Systems | Robotic Lunar Exploration | Lunar Reconnisiance Orbiter |
| Exploration Systems | Constellation Systems | Robotic Lunar Exploration | Lunar Robotics Lander |
| Exploration Systems | Constellation Systems | Robotic Lunar Exploration | Future Missions |
| Exploration Systems | Constellation Systems | Robotic Lunar Exploration | Robotic Lunar Exploration |
| Exploration Systems | Constellation Systems | | |
| Exploration Systems | Constellation Systems | | |
| Exploration Systems | Constellation Systems | | al 1 |
| Exploration Systems | Constellation Systems | | |
| Exploration Systems | Constellation Systems | | |

**Search Form for Agency Program & Project List By Mission Directorate/Support**

| | |
|---|---|
| Mission Directorate: | |
| Theme: | |
| Program: | |
| Project: | |
| Product Line: | |
| Program Manager: | |
| Project Manager: | |
| Management Group: | |
| Governing PMC: | |
| Project Current Phase: | |
| Project Category: | |

**Project/Activity Detail**

| | |
|---|---|
| Project or Activity | Lunar Reconnisiance Orbiter |
| Project Manager | |
| Project or Activity Management Group | |
| Project Governing PMC Name | |
| Project/Activity Management Group Name | |
| Independent Review Organization Name | |
| Project Category | |
| Product Line | |
| Project Life Cycle Phase | |
| Project Life Cycle Phase Transition Date | |
| Risk Classification for Payloads | |
| Project/Activity | |
| Leading Center (Project Management Center) | |
| Last Updated Date | |
| Program | Robotic Lunar Exploration |
| Theme | Constellation Systems |
| Mission Directorate | Exploration Systems |

# Project Categorization

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

- Programs & Projects @ NASA
  - Program & Project List
  - Key Management Documents
  - NASA Management Structure
  - PROJECT CATEGORIZATION
  - Appointing P/P Managers
- Management Support
- Support Disciplines

## Project Categorization

Project management requirements and Agency attention and oversight should track with the investments magnitude and Agency priority.

| Priority | Life Cycle Cost | | |
|---|---|---|---|
| | LCC < $100M | $100M ≤ LCC < $500M | LCC ≥ $500M |
| High | Category II | Category I | Category I |
| Moderate | Category III | Category II | Category I |
| Low | Category III | Category III | Category II |

Project Categorization Schema

**Projects are categorized at level I, II, or III. Categorization determines:**

- Governing PMC
- Independent Assessment organization
- Level of detail of the Program and Project Plans

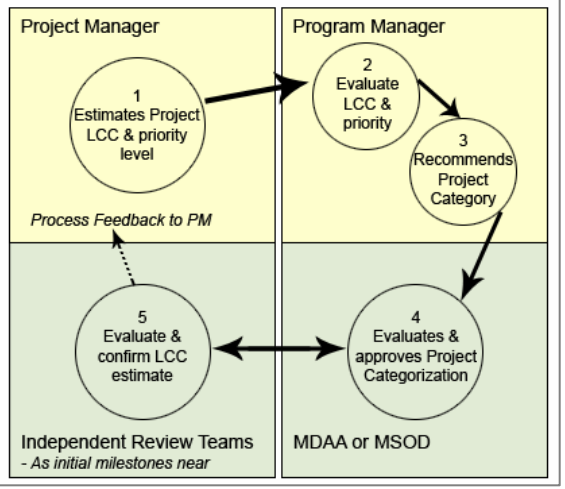
**More Information:**

- Project Categorization Approval Chain
- Measuring Project Cost
- Determining Project Priority

## Project Categorization Approval Chain

**Who Decides?**

- Program Manager, with approval of MDAA or MSOD




## Governing PMCs

One of the standing PMCs serves as the Governing PMC (GPMC) for a given program or project. The GPMC is the highest level PMC that has the responsibility to regularly review a program or project. The GPMC is assigned according to project categorization. For institutional projects, the NASA Institutional Committee (IC) acts as the GPMC.

*Source: NPR 7120.5C, 1.7.4, 1.7.5 and 7.1.e, footnote 42.*

| Project Category | Governing PMC |
|---|---|
| I | Agency PMC |
| II | Mission Directorate PMC (or MSOD PMC) |
| III | Center PMC* |

*For basic and applied research projects, the Mission Directorate SMC or equivalent serves as GPMC. More Information

# Life Cycles & Reviews

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

- Programs & Projects @ NASA
- Management Support
  - Life Cycles & Reviews
    - By Product Line
      - Basic & Applied Research
      - Advanced Technology Development
      - FLIGHT SYSTEMS & GROUND SUPPORT
      - Institutional
    - Comprehensive Reviews List
  - Common Core WBS
  - NPR 7120 Requirements
  - NPR 7120 Deviation / Waiver
  - Products, Templates & Examples
  - Tools
  - Checklists
  - Technical Standards
  - P/P Manager Responsibilities
  - Training
- Support Disciplines

## Flight Systems and Ground Support Program and Project Life Cycle and Reviews

**Flight Systems and Ground Support Program**

| Phases | Formulation | Implementation |
|---|---|---|
| Reviews | Pre-NAR; Approval (NAR) | PIR * |

**Flight Systems and Ground Support Project**

| Life Cycle Phases | Pre-Phase A Concept Studies | Phase A Concept Development | Phase B Preliminary Design | Phase C Final Design | Phase D Fabrication, Assembly & Test | Phase E Operations & Sustainment | Phase F Disposal |
|---|---|---|---|---|---|---|---|
| Reviews (Traditional) | | | Pre-NAR | Approval (NAR) | | | |
| Reviews (AO Driven) | | Downselect Step 1 | Step 2 Selection | NAR ** | | | |
| Typical Project Milestone Reviews *** | | MCR PCR | MDR PRR SRR SDR | PDR | CDR DCR SAR FRR ORR | | DR |

Most reviews hyperlinked for more information

Source: NPR 7120.5C Figure 6-1, 2.5.6, SP-6105

* Nominally every 2 years throughout implementation, typically at Program Milestone Reviews

** Often referred to as a Confirmation Review

*** Project Milestone Reviews derived from NASA System Engineering Handbook (SP-6105)

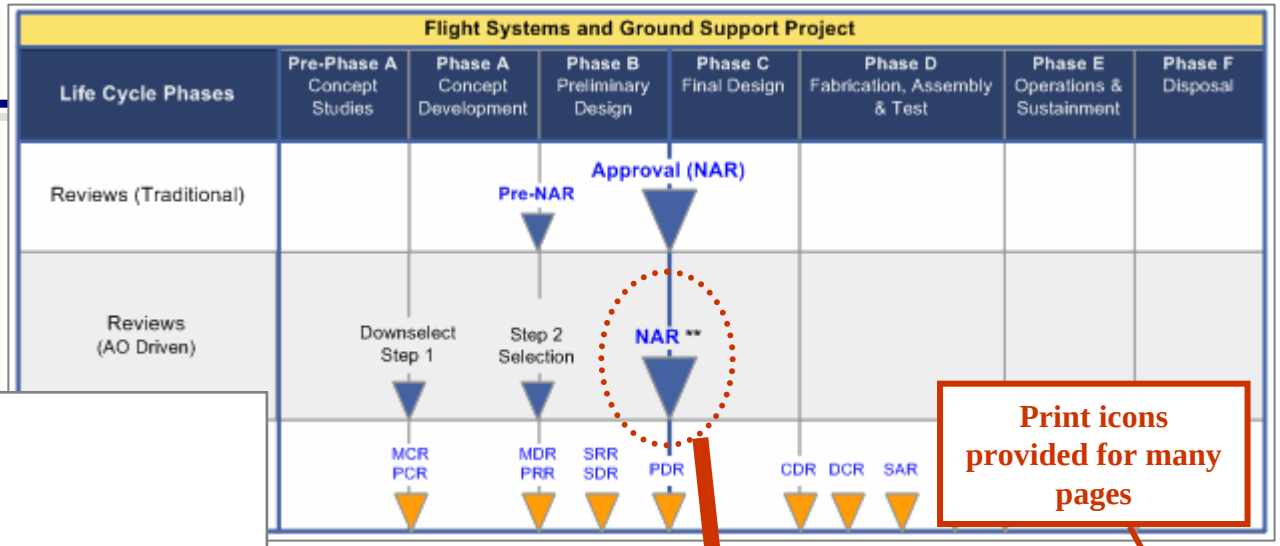
POLARIS sites sources whenever possible

### Distinguishing Aspects of this Product Line

- Results in advanced aircraft or other atmospheric vehicles, spacecraft, and space/ground communications networks in direct support of a NASA theme or program
- Flight and ground products often developed via contracts with industry
- Includes operations and sustainment of successful flight systems and ground support (for example: Space Shuttle and ISS operations)
- Projects typically lay the foundation for future investments and desired capabilities

Source: NPR 7120.5C, 1.4.1.c

# Review & Products Details




## H.1.2 Assessment Criteria

| | CoDR | Pre-NAR | NAR | PR | PIR |
|---|---|---|---|---|---|
| Alignment with and contributing to Agency vision and strategic goals | Demonstrate | Demonstrate | Demonstrate | | Demonstrate |
| Adequacy / Availability of resources | Demonstrate | Demonstrate | Demonstrate | Execution | Execution |
| Adequacy of budget and budget management planning | Demonstrate | Demonstrate | Demonstrate | Execution | Execution |
| Adequacy of schedule and schedule management planning | Demonstrate | Demonstrate | Demonstrate | Execution | Execution |
| Adequacy of the technical approach and | Demonstrate | Demonstrate | Demonstrate | Execution | Execution |

**Print icons provided for many pages**

**Review and Products Information**

**Flight Systems and Ground Support**

**Non-Advocate Review (NAR)**

A Non-Advocate Review (NAR) is an independent review process of programs and projects conducted at the end of formulation[1]. It provides Agency management with an independent assessment of the readiness of the program or project to proceed into implementation. Upon successful completion of this review process, a recommended program or project baseline is established. Review criteria include assessment of the program's or project's preliminary formulation activities, plans for implementation and final implementation documentation.

[1]For Flight Systems and Ground Support projects this is the end of preliminary design. For Institutional projects this is the end of preliminary design/analyses. For Advanced Technology projects this is the end of system & portfolio analysis. For Basic and Applied Research projects this is following the recommendation of proposals for selection.

*Source: 7120.5, App. H 1.1.4 (modified to apply to any Product Line)*

| | |
|---|---|
| Objectives: | TBD |
| Criteria: | See NPR7120.5 Table H-1 - Assessment Criteria *(NODIS)* |
| Timing: | Occurs at the conclusion of program/project formulation, prior to implementation. |

**NAR Products list on next slide**

# Review Products

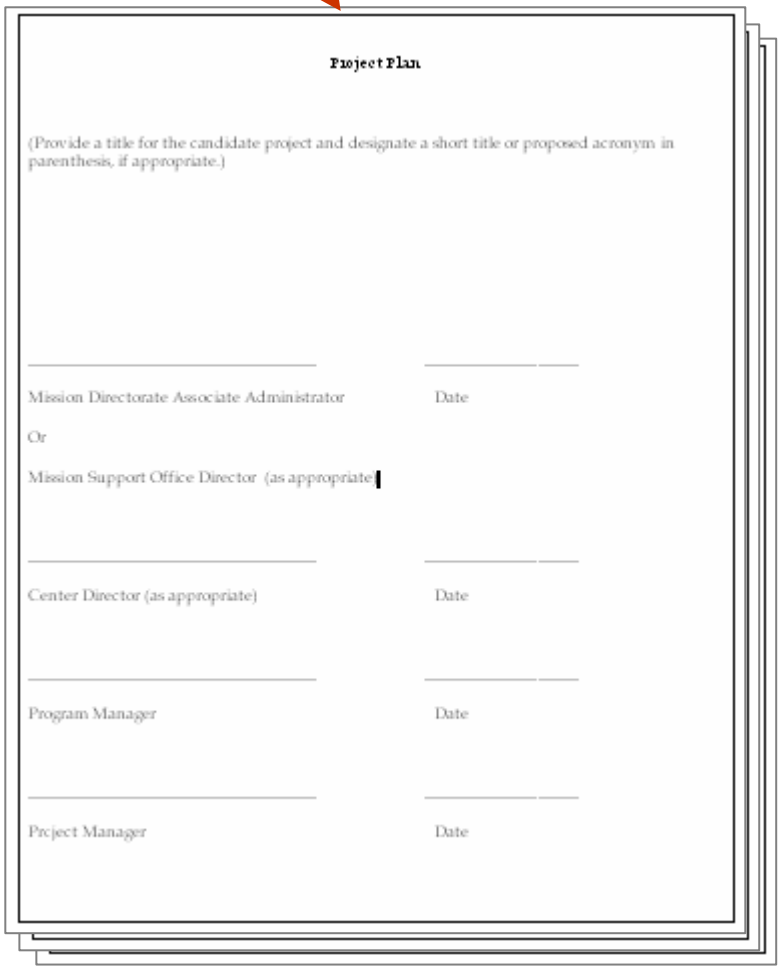
POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

**Product Details**

| | |
|---|---|
| **Name:** | Project Plan |
| **Description:** | |
| **Comments:** | |
| **Reference Section:** | 3.2.1.2.a<br>3.2.d<br>6.2.1.e<br>D1 |
| **Category:** | Project Product |
| **Template** | Project Plan (62.98 kb) |
| **Example** | MER Project Plan Example (67.07 kb) |

**Review and Products Information**

| NPR 7120.5 Section | Product | Maturity at NAR | Template | Example |
|---|---|---|---|---|
| 3.2.1.2.h | Project Acquisition Strategy | Final | | |
| 3.2.d | Project Baseline | Final | | |
| 3.2.1.2.d2.i | Project Communications Plan | Final | | |
| 3.2.5.2.a | Project Control Plan | Final | | |
| 3.2.b | Project Formulation Authorization Document | Approved (Approved prior to start of Formuation) | T | |
| 3.2.1.2.a<br>3.2.d<br>6.2.1.e<br>D1 | Project Plan | Final | T | E |
| 3.2.5.2.b<br>D.3.10 | Project Review Plan (A Standalone Review Plan is Required) | Final | | |
| 3.2.3.3.e | Project Verification and Validation Plan | Final | | |
| 3.2.1.1<br>3.2.1.2.b<br>6.2.1a<br>6.2.1.b | Project WBS and WBS Dictionary | Final | | |
| 3.2.5.2.d<br>D.3.3 | Risk Management Plan, Including Identification of Primary Risks (A Standalone Risk Mgt Plan is Required) | Final | | |
| 3.2.2.2.a.1<br>3.2.2.b.1<br>6.2.2.b | Risk-Based LCC Estimate Consistent With Project WBS, Schedule & Performance. Appended to CADRe as | Estimate (NAR Estimate) | | |



Project Plan

(Provide a title for the candidate project and designate a short title or proposed acronym in parenthesis, if appropriate.)

Mission Directorate Associate Administrator — Date

Or

Mission Support Office Director (as appropriate) — Date

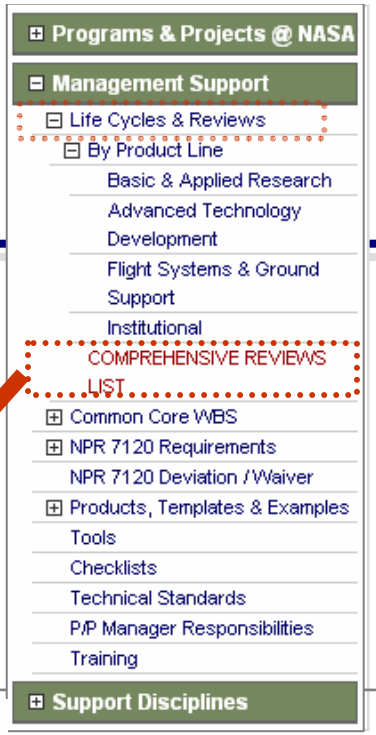
Center Director (as appropriate) — Date

Program Manager — Date

Project Manager — Date

# Comprehensive Reviews List

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM




## Comprehensive Reviews Listing

### NPR 7120.5 Review(s)

| Review Short Name | Review Long Name |
|---|---|
| NAR | Non-Advocate Review |
| Pre-NAR | Preliminary Non-Advocate Review |
| PIR | Program Implementation Review |

### SP-6105 Review(s)

| Review Short Name | Review Long Name |
|---|---|
| MCR/PCR | Mission Concept Review/Project Concept Review |
| MDR/PRR | Mission Definition Review/Project Requirements Re |
| SRR/SDR | System Requirements Review/System Definition Re |
| PDR | Preliminary Design Review |
| CDR | Critical Design Review |
| DCR | Design Certification Review |
| SAR | System Acceptance Review |
| FRR | Flight Readiness Review |
| ORR | Operational Readiness Review |
| DR | Decommissioning Review |

## Review Details

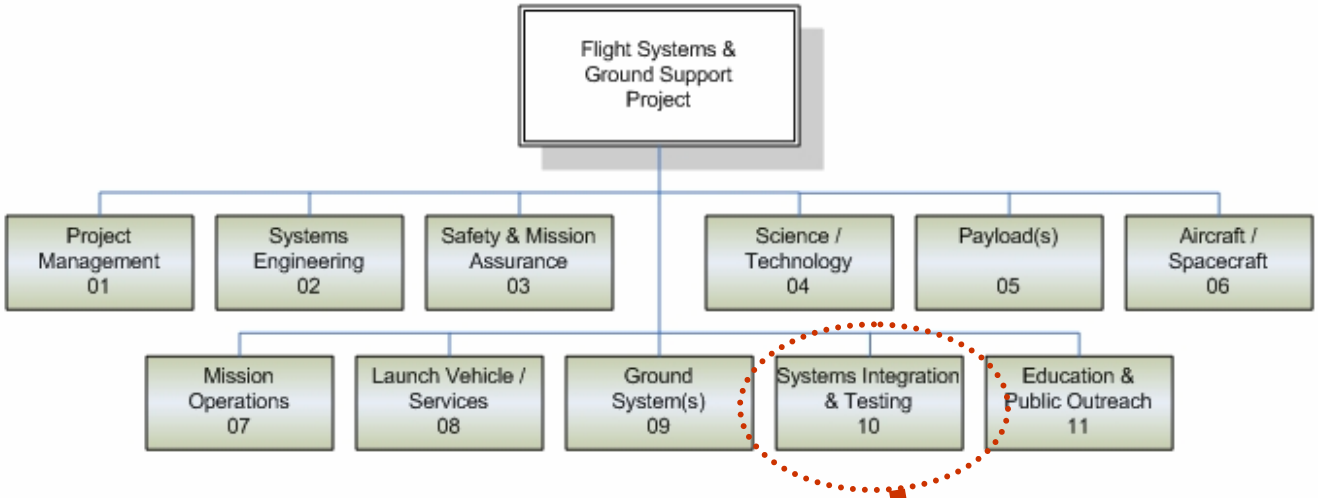
| | |
|---|---|
| Review Name: | Design Certification Review (DCR) |
| Description: | The DCR ensures that the qualification verifications demonstrated design compliance with functional and performance requirements. |
| Objectives: | • Confirm that the verification results met functional and performance requirements, and that test plans and procedures were executed correctly in the specified environments<br>• Certify that traceability between test article and production article is correct, including name, identification number, and current listing of all waivers<br>• Identify any incremental tests required or conducted due to design or requirements changes made since test initiation, and resolve issues regarding their results. |
| Criteria: | The following items comprise a checklist to aid in determining successful completion of DCR:<br>• Are there any changes in the test article configuration or design resulting from the as-run tests? Do they require design or specification changes, and/or retests?<br>• Have design and specification documents been audited?<br>• Do the verification results satisfy functional and performance requirements?<br>• Do the verification, design, and specification documentation correlate? |
| Timing: | Follows the system CDR, and after qualification tests and all modifications needed to implement qualification-caused corrective actions have been completed. |
| Review Package | |
| Review Agenda | |

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

- Programs & Projects @ NASA
- Management Support
  - Life Cycles & Reviews
  - Common Core WBS
    - Requirements & Approval
    - WBS by Product Line
      - Basic & Applied Research
      - Advanced Technology Development
      - FLIGHT SYSTEMS & GROUND SUPPORT
      - Institutional
  - NPR 7120 Requirements
  - NPR 7120 Deviation / Waiver
  - Products, Templates & Examples
  - Tools
  - Checklists
  - Technical Standards
  - P/P Manager Responsibilities
  - Training
- Support Disciplines

## NASA Standard WBS - Flight Systems and Ground Support

Standard Level 2 WBS elements for the Flight Systems and Ground Support product line are shown. This standard WBS template assumes a typical spacecraft flight development project with relatively minor ground or mission operations elements. For major launch or mission operations ground development activities which are viewed as projects unto themselves, the WBS may be modified. For example, the aero-craft/spacecraft element may be changed to reflect the ground project major deliverable product (such as a facility). The elements such as payload, launch vehicle/services, ground systems, mission operations system may not be applicable and may be deleted.




* Click on any Element to see defintion.

Click here to download Flight Systems and Ground Support WBS and dictionary.

*Source: 7120.5C Rev 1, I.3*

**Element 9 – Ground System(s):** The complex of equipment, hardware, software, networks, and mission-unique facilities required to conduct mission operations of the aero-craft or spacecraft systems and payloads. This complex includes the computers, communications, operating systems, and networking equipment needed to interconnect and host the Mission Operations software. This element includes the design, development, implementation, integration, test and the associated support equipment of the ground system, including the hardware and software needed for processing, archiving and distributing telemetry and radiometric data and for commanding the aeronautical or space craft. Also includes the operations, maintenance, and disposal of the project testbeds and project-owned facilities. This element does not include integration and test with the other project systems and conducting mission operations.

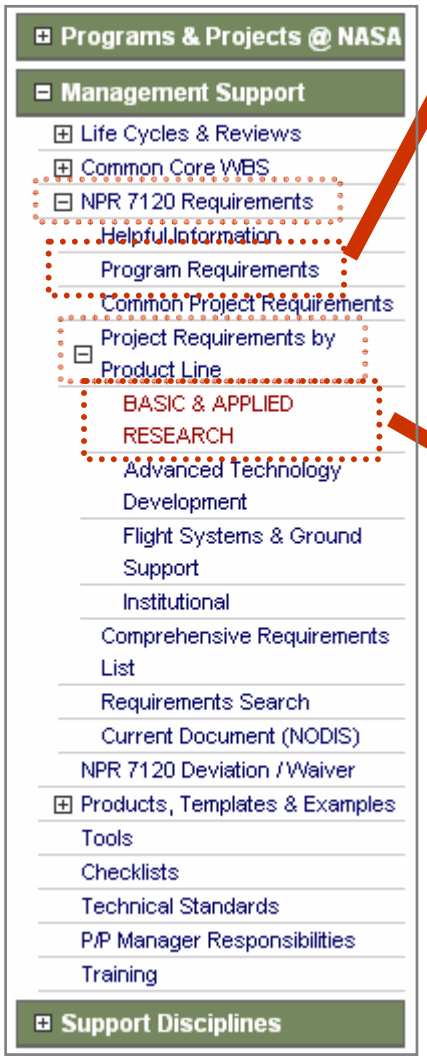
**Element 10 – Systems Integration & Testing:** This element includes the hardware, software, procedures and project-owned facilities required to perform the integration and testing of the project´s systems, payloads, aircraft / spacecraft, launch vehicle / services, and mission operations.

**Element 11 – Education & Public Outreach:** Provide for the education and public outreach (EPO) responsibilities of NASA´s missions, projects, and programs in alignment with the Strategic plan for Education (Includes management and coordinated activities, formal education, informal education, public outreach, media support, and web site development).

# Standard WBS by Product Line

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

# 7120.5 Requirements




| | Number | Statement |
|---|---|---|
| 20 | 2.2.2.a.4 | Early in program formulation, the Program Manager, in consultation with the MDAA (or MSOD), shall recommend a Technical Warrant Holder (TWH). The NASA Chief Engineer selects the TWH. |
| 21 | 2.2.2.b | Create a program organizational and financial structure. |
| 22 | 2.2.2.b.1 | The Program Manager shall build a program organizational structure that assigns clear lines of responsibility, authority, and accountability to specific Centers, Project Managers, partners, advisory groups, and oversight boards. |
| 23 | 2.2.2.b.2 | Working in close cooperation with the OCFO, the Program Manager shall be responsible for creating financial management structures that comply with budget and accounting standards established by that Office. |
| 24 | 2.2.2.c | Develop a program technical approach. |
| 25 | 2.2.2.c.1 | As applicable, the Program Manager shall identify scientific and engineering research and development |

| | Number | Statement |
|---|---|---|
| 1 | 4 | CHAPTER 4. Basic and Applied Research Portfolios |
| 2 | 4.2 | Portfolio Formulation |
| 3 | 4.2.b | During formulation, the Portfolio Manager performs and orchestrates the following activities: |
| 4 | 4.2.1 | Portfolio Planning Requirements: The MDAA- or MSOD-designated Portfolio Manager shall: |
| 5 | 4.2.1.a | Prepare a Portfolio Process Plan. |
| 6 | 4.2.1.a.1 | At a minimum, the Portfolio Process Plan shall: |
| 7 | 4.2.1.a.1.i | Define and document portfolio objectives that support Agency, Theme, and program goals. The Portfolio Manager coordinates with the cognizant MDAA (or MSOD) and Program Manager. |
| 8 | 4.2.1.a.1.ii | Define a process for the solicitation, evaluation, and selection of proposals (including identifying Selection Official(s)). |
| 9 | 4.2.1.a.1.iii | Establish evaluation criteria including considerations of quality, relevance to NASA missions and strategic goals, and performance. |
| 10 | 4.2.1.a.1.iv | Include an integrated portfolio budget typically for three or five years (including appropriate WBS elements). |
| 11 | 4.2.1.a.1.v | Include a multi-year schedule for the portfolio. |
| 12 | 4.2.1.a.1.vi | Include portfolio evaluation processes. |
| 13 | 4.2.1.a.2 | Create a management and control structure to implement the |
| 14 | 4.2.1.b | Obtain approval of the Portfolio Process Plan. The Portfolio M the Program Manager for approval. |
| 15 | 4.2.2 | Proposal Solicitation, Evaluation, and Selection Requirements: The Portfolio Manager shall: |
| 16 | 4.2.2.a | Initiate solicitation and receipt of proposals through the issuance of a Broad Agency Announcement following the process established in the approved Portfolio Process Plan. Prospective PIs participate in portfolio formulation by preparing and submitting proposals in response to a solicitation. Research proposals for individual investigations include proposed research designs, budgets, schedules, and expected outcomes. |
| 17 | 4.2.2.b | Using peer review processes established in NPR 1080.1 *Science Management*, evaluate proposals based on the criteria established in the solicitation. |
| 18 | 4.2.2.c | Recommend proposals for selection. Specifically, the Portfolio Manager shall: |
| 19 | 4.2.2.c.1 | Review findings from peer review and other factors, and recommend selections for approval by the Selection Official. |

**Links to pertinent documents are provided when possible**

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

# 7120.5 Reqts Search

- Programs & Projects @ NASA
- Management Support
  - Life Cycles & Reviews
  - Common Core WBS
  - NPR 7120 Requirements
    - Helpful Information
    - Program Requirements
    - Common Project Requirements
    - Project Requirements by Product Line
    - Comprehensive Requirements List
    - REQUIREMENTS SEARCH
    - Current Document (NODIS)
  - NPR 7120 Deviation / Waiver
  - Products, Templates & Examples
  - Tools
  - Checklists
  - Technical Standards
  - P/P Manager Responsibilities
  - Training
- Support Disciplines

**Requirements Search**

| | |
|---|---|
| Document Version | NPR 7120.5C-R1 (current) |
| Requirements No. | |
| Search Term or Phrase: | |
| Requirement Type: | ○ Program Requirement<br>◉ Project Requirement<br>☐ Common<br>☐ Basic and Applied Research<br>☐ Advanced Technology Development<br>☑ Flight Systems and Ground Support - Traditional<br>☐ Flight Systems and Ground Support - AO-Driven<br>☐ Institutional - Capital Assets<br>☐ Institutional - Non-Capital Assets |
| Keywords | Cost Estimating Expand |

Search Reset Clear

**A**
- ☐ Acq, Proc, Cont Mngmnt
- ☐ Acquisition
- ☐ Agreement

**B**
- ☐ Baseline

**C**
- ☐ Communications
- ☐ Compliance
- ☐ Configuration Management
- ☐ Content Management (CM)
- ☐ Cost Analysis Data Requirement (CADRe)
- ☐ Cost Estimating
- ☐ Customer

**D**
- ☐ Deviations
- ☐ Disposal

**E**
- ☐ Earned Value Management (EVM)
- ☐ Education & Public Outreach (E & PO)
- ☐ Emergency
- ☐ Environment
- ☐ Export Control

**K**
- ☐ Key Performance Parameter (KPP)
- ☐ Knowledge Management

**L**
- ☐ Launch Services
- ☐ Lessons Learned
- ☐ Life-Cycle Cost Estimate (LCCE)
- ☐ Logisitics

**M**
- ☐ Margins
- ☐ Mission Assurance
- ☐ Mission Operations

**N**
- ☐ National Environmental Policy Act (NEPA)
- ☐ Non-Advocate Review (NAR)

**O**
- ☐ Orbital Debris

**P**
- ☐ P/P Control
- ☐ Planetary Protection
- ☐ Probabilistic Risk Assessment (PRA)

**V**
- ☐ Verification and Validation (V & V)

**W**
- ☐ Waivers
- ☐ Work-Breakdown Structure (WBS)

| | Number | Statement |
|---|---|---|
| 1 | 3.2.1.2.e.1.iii | Full cost assessments and risk assessments shall be performed to identify preferred sources of technology. |
| 2 | 3.2.1.2.f.3 | A business case justification shall be performed for any proposed acquisition or major modification of infrastructure (e.g., facilities, IT). |
| 3 | 3.2.1.2.f.3.i | The business case shall include full life cycle cost (including operations, sustainment, and disposal), benefit estimates, alternatives and sensitivity analyses, and risk assessments. (More information on full cost and practices) |
| 4 | 3.2.1.2.f.3.ii | The business case shall be approved by the cognizant MDAA (or MSOD) who will coordinate with the NASA Headquarters functional office, or its designee(s). |
| 5 | 3.2.2.2.a | Develop an initial Life Cycle Cost Estimate (LCCE). |
| 6 | 3.2.2.2.a.1 | The Project Manager shall develop an initial LCCE consistent with the project WBS, schedule, and performance parameters to form the project estimate (to be included in the initial Project Plan, Part |

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

- Programs & Projects @ NASA
- Management Support
  - Life Cycles & Reviews
  - Common Core WBS
  - NPR 7120 Requirements
    - Helpful Information
    - Program Requirements
    - Common Project Requirements
    - Project Requirements by Product Line
    - COMPREHENSIVE REQUIREMENTS LIST
    - Requirements Search
    - Current Document (NODIS)
  - NPR 7120 Deviation / Waiver
  - Products, Templates & Examples
  - Tools
  - Checklists
  - Technical Standards
  - P/P Manager Responsibilities
  - Training
- Support Disciplines

*Record Count:* **642**

Generate Compliance Matrix

| | Number | Statement |
|---|---|---|
| 1 | 2 | CHAPTER 2. Program Management Requirements |
| 2 | 2.1 | Four-Part Program Management Process |
| 3 | 2.1.a | As a strategic management structure, the program construct is extremely important within NASA. Programs provide the critically important linkage between the Agency's ambitious goals and the projects that are the instruments for achieving them. Programs vary significantly in scope, complexity, cost, and criticality however, a properly designed and executed program structure inevitably contributes to sound project management being embraced and practiced at lower levels. To initiate individual programs, a Mission Directorate (or Mission Support Office) shall prepare a Program Formulation Authorization Document (FAD). |
| 4 | 2.1.b | The Program Manager is responsible for ensuring that program goals address the Mission Directorate Strategies and Mission Support Office Functional Leadership Plans and that the program's content, which may contain multiple product lines, addresses those program goals. The Program Manager shall be responsible for recommending to the MDAA (or MSOD) the appropriate product line for each project in his/her program. The Program Manager coordinates program content with the Mission |

**NPR 7120.5C Compliance Matrix**

Note: For non-compliance, approved deviation(s) and/or waivers(s) must be attached

| Program/Project Name: | Date: |
|---|---|
| | |
| **Program/Project Manager:** | |

| Requirement Number | Requirement | Compliant (Yes/No) | Rationale |
|---|---|---|---|
| 2 | CHAPTER 2. Program Management Requirements | | |
| 2.1 | Four-Part Program Management Process | | |
| 2.1.a | As a strategic management structure, the program construct is extremely important within NASA. Programs provide the critically important linkage between the Agency's ambitious goals and the projects that are the instruments for achieving them. Program significantly in scope, complexity, cost, and criticality howev properly designed and executed program structure inevitably contributes to sound project management being embraced a practiced at lower levels. To initiate individual programs, a Mi Directorate (or Mission Support Office) shall prepare a program Formulation Authorization Document (FAD). | | |
| 2.1.b | The Program Manager is responsible for ensuring that program goals address the Mission Directorate Strategies and Mission Support | | |

# 7120.5 Compliance Matrix

**Compliance matrix is generated in Excel format for ease of use**

# NPR 7120.5 Deviation/Waiver

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

## NPR 7120.5C Deviation / Waiver Form Instructions

**Submittal Instructions:**

Prior to the NAR, Deviation and Waiver requests are documented in the NPR 7120.5 compliance matrix and attached to a *single* deviation or waiver form to assure proper routing and control.

Deviations or waivers impacting formulation or requiring long lead-time shall be submitted individually early in formulation.

Following the NAR, deviations or waivers must be submitted individually to the appropriate authority.

**Approval Instructions:**

Requests for deviations or waivers to NPR 7120.5 requirements are documented and submitted for approval by the Project Manager, the Program Manager, and the GPMC as required by NPR 7120.5, requirement 3.1.c.

A project's GPMC is determined by Project Category

The Project Manager should receive written authorization from the Office of Security and Program Protection for waiver of activities related to security.

**Form:**

NPR 7120.5C Deviation / Waiver Form


### NPR 7120.5C Deviation/Waiver Form

| | | |
|---|---|---|
| Name of Program or Project Requesting Deviation/Waiver: | Date of Request: | Date Deviation/Waiver is Needed: |
| Name and Organization of Initiator : | Requirement to be Deviated/Waived: | |
| Project Deliverable Affected:<br>€ None € Ground € Flight € Software<br>€ Other | Deviation/Waiver To:<br>€ Policy € Procedure € Requirement € Other | |
| Original Requirement of Document to be Deviated/Waived (list Appropriate Sections or Text) | | |
| Deviation/Waiver Requested: | | |

POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

- Programs & Projects @ NASA
- Management Support
  - Life Cycles & Reviews
  - Common Core WBS
  - NPR 7120 Requirements
  - NPR 7120 Deviation / Waive
  - Products, Templates & Examples
  - TOOLS
  - Checklists
  - Technical Standards
  - P/P Manager Responsibilities
  - Training
- Support Disciplines

# Tools & Checklists

**Tools**

| Name | Description | Source | URL | Comments |
|---|---|---|---|---|
| Competency Management System | The NASA Competency Management System (CMS) is a collection of business processes, data and tools that are used to categorize, identify, measure, and forecast the Agency's corporate knowledge base | HQ | | |
| ePort - Online Project reporting tool | The electronic Project Online Reporting Tool (ePORT) is a web-based risk management tool that provides a common framework for all programs, projects and activities, independent of their size and budget, to capture and manage their risks. | MSFC | | |
| KSC Systems Engineering Tools Study | Report from a Systems Engineering Tools study, performed by KSC, in support of the HQ Office of the Chief Engineer. | KSC | | |
| long (sh | descr | source | | comments |
| RBAM t | A Microsoft Excel | | | |
| Risk Ma | | | | |

**Checklists**

| Name | Category | Source | URL |
|---|---|---|---|
| Assessment of Risk Management checklist from NPR 8 | Risk Management | NODIS - NPR 8000.4 | |
| Mission Success First Checklist from Investigation | Project Management | HQ | |
| PM Checklist & Review Checklist | Project Management | MSFC-SMO | |
| PM Success Criteria | Project Management | HQ - James Afarin | |
| Program Health Summary - pdf | Project Management | ARC-SMO | |
| Program Health Summary - Powerpoint | Project Management | ARC-SMO | |

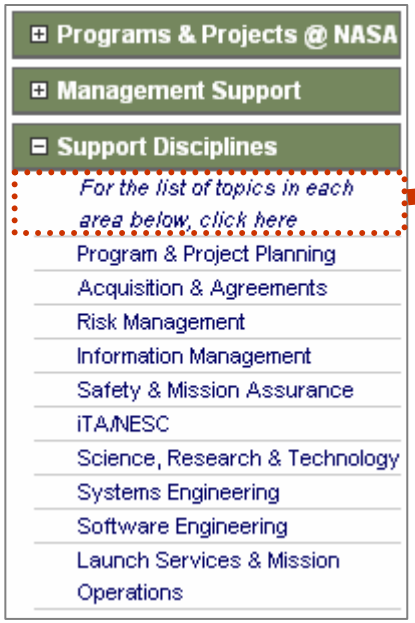
POLARIS
PROJECT ONLINE LIBRARY AND RESOURCE INFORMATION SYSTEM

**Cost Estimating**

- Requirements from NPR 7120.5
- Cost Estimating Handbook
- NASA Cost Estimating Site
- Cost Analysis Steering Group Members *
- Center Cost Estimating POCs
- Space Launch Operations Cost Estimating Process Definition Handbook (KSC)

**EVM / Scheduling**

- **Policy and Requirements**
  - EVM Requirements from NPR 7120.5
  - Scheduling Requirements from NPR 7120.5
  - EVM Policy & Requirements
- **Helpful Sites / Links**
  - Agency EVM Site
  - EVM Handbook
  - Scheduling Handbook
  - Integrated Baseline Review Handbook
  - Scheduling Resource Website





**Export Control / Foreign Access**

- **Policy and Requirements**
  - Requirements from NPR 7120.5
  - NPD 2190.1-NASA Export Control Program Policy
  - NPR 2190.1-NASA Export Control Program Procedure
  - NPD 1371.5 - Coordination and Authorization of Access by Foreign Nationals and Foreign Representatives to NASA
  - NPR 1371.2A - Processing Requests for Access to NASA Installations or Facilities by Foreign Nationals or US
  - NPD 2110.1 - Foreign Access to NASA Technology Transfer Materials
  - NPD2200.1 - Management of NASA Scientific and Technical Information (STI)
  - NPR 2200.2 - Requirements for Documentation, Approval and Dissemination of NASA Scientific and Technical Information
  - NPR 2210.1 - External Release of NASA Software
- **Helpful Sites & Links**
  - Overview Briefing on Export Control Regulations
  - NASA Export Control Program
  - NASA Office of External Relations
  - Helpful Government Agencies *

# PM Disciplines

**Topics covered include:**

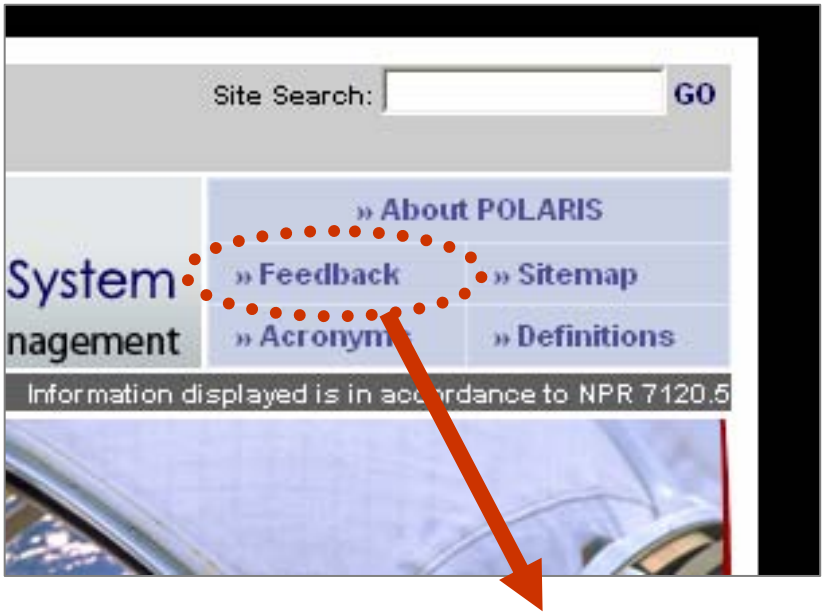
- **Policy & Requirements**
- **Handbooks & Guidance**
- **Helpful sites/links**
- **Training**
- **Tools**
- **Products, Templates, Examples**
- **Points of Contact**

**Facilities**

- **Policy and Requirements**
  - Requirements from NPR 7120.5
  - NPD 8820.2 - Design and Construction of Facilities Policy
  - NPR 8820.2 - Facility Project Implementation Guide
  - NPD 8820.3 - Facility Sustainable Design
  - NPD 8831.1 - Maintenance of Institutional and Program Facilities and Related Equipment
  - NPR 8831.2 - Facilities Maintenance Management
- **NASA**
  - Major NASA Facilities Inventory site *
  - Rocket Propulsion Facilities

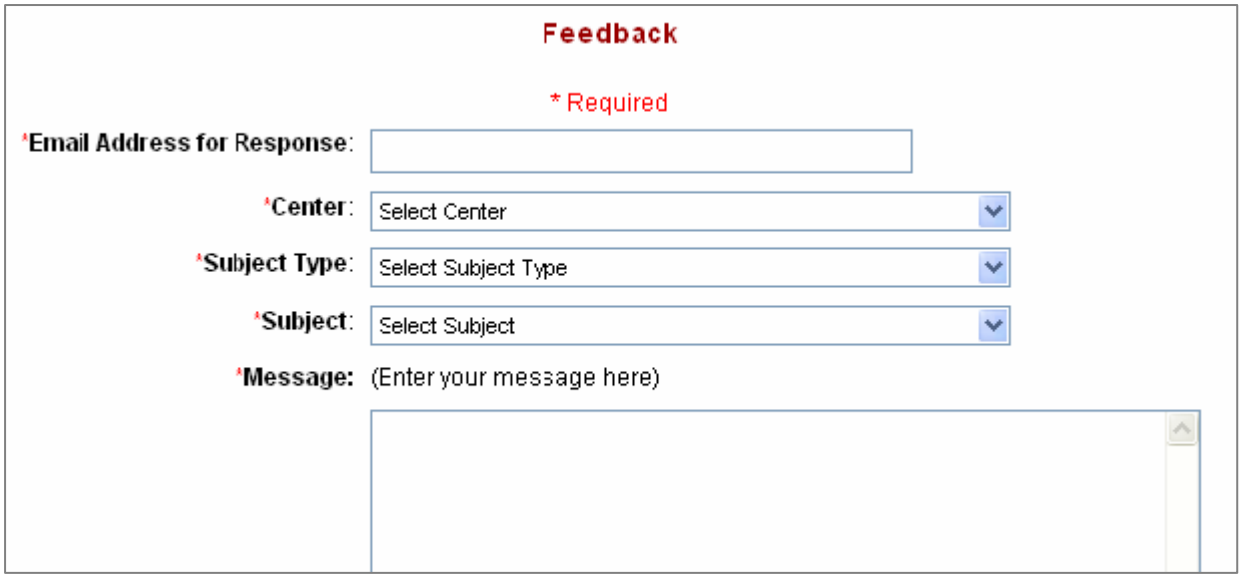
  * Note: Requires ID and password
- **LRC**
  - LRC Facilities
- **DRFC**
  - DRFC Research facilities
- **GRC**
  - GRC Research Facilities
  - Smaller Test Facilities
- **JSC**
  - JSC Facilities
- **KSC**
  - KSC facilities
- **MSFC**
  - Engineering Facilities
  - Optics Manufacturing Facilities
- **SSC**
  - Propulsion Test Facilities
- **ARC**
  - Microgravity Test Facility
  - Mission Simulation Facility

# We need your help…..




**We want POLARIS to be a living tool, providing improving support to Program and Project Managers as management policy and requirements evolve. We need your good ideas and constructive criticism to make this tool responsive to your needs.**

**Please take the time to let us know what you think!**



# Planned Future Enhancements

- Additional data on Programs and Projects (product line, category, Governing PMC, manager name, life cycle phase, leading center, etc.)
  - Dependent on agency MDM application being fully populated and kept current
- Additional product templates and examples
- Replacement of 6105 review content with new NPR 7123 (Systems Engineering) review content (SRR, SDR, PDR, CDR)
  - Pending approval of the NPR
  - Working to get approval of HQ Systems Engineering Lead
- Additional review content (example data packages, example agendas, review plans, etc)

***Many items dependent on HQ for review and approval of content***

# Other Possible Applications

Of the website…..

- NPR 7123, Systems Engineering NPR
  - Either import similar data to NPR7120 into POLARIS (merges Systems Engineering and Project Management into one site)
  - Or, create similar site for Systems Engineering
- Use POLARIS type site for mission directorates, with content being mission directorate specific
  - Potential for linking (traceablility) of agency requirements
- Use POLARIS type site for Center level application, with content being Center level policy, requirements, guidance and links.
  - Potential for linking (traceability) of agency requirements

# Other Possible Applications

- Of the requirements database…..(unlimited potential)
  - All Agency requirements (NPRs) databased with keywords and linked to show traceability and dependency. Keywords could allow:
    - Generation of requirements list by role (i.e. all requirements a facilities manager must meet)
    - Generation of comprehensive requirements list on a particular subject (i.e. all EVM requirements)
    - Generation of Compliance Matrices
    - Generation of job descriptions & performance evaluations
  - All Mission Directorate requirements databased with keywords and linked to have traceability to Agency requirements.
  - All Center requirements databased with keywords and linked to have traceability to both Mission Directorate and Agency requirements.

# Summary

- POLARIS tool is designed to support Program and Project Management
  - Continuous improvement planned
  - Maintenance planned to remain current

- POLARIS needs your support and input to be successful
  - Make it what *you* need

- POLARIS could be applied to other agency requirements (NPRs) and to Mission Directorates and Field Centers
  - Requires up front investment and on-going maintenance support